UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/973,629	10/09/2001	Jing Cheng	ART-00105.P.1.1-US	6241

24232 7590 06/15/2004

DAVID R PRESTON & ASSOCIATES
12625 HIGH BLUFF DRIVE
SUITE 205
SAN DIEGO, CA 92130

EXAMINER	
LAM, ANN Y	

ART UNIT	PAPER NUMBER
1641	

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/973,629	CHENG ET AL.	
	Examiner	Art Unit	
	Ann Y. Lam	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *March 1, 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19,20,22-30 and 33-36* is/are rejected.

7)☒ Claim(s) *21,31 and 32* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/1/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed September 9, 2002 (and a copy filed March 10, 2004) fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. (The copies of documents listed under "Other Documents" were not found by Examiner. Since it appears that the references listed as "Other" on the IDS are not being scanned by the contractors for whatever reason, and thus Examiner is unable to view the documents, Examiner invites Applicant to fax the documents to Examiner's own fax number 571-273-0822. This would ensure that Examiner will have copies of the documents for consideration. Examiner sincerely apologizes for the inconvenience.)

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 30-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 30 recites the limitation " wherein said one or more chips is two or more chips." It appears from the claim that one chip can be two or more chips. If that is the case, it is unclear how one chip can be two or more chips.

Claims 31-36 are rejected as being indefinite since they depend on claim 30, which is indefinite for the above stated reason.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 19, 20, 22, 24, 25, 28, 29, 30, 34-36 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 19 of U.S. Patent No. 6,716,642, in view of Blankenstein, 6,432,630.

Patent '642 discloses the invention substantially as claimed.

More specifically, as to claim 19, Patent '642 discloses a system comprising a chip (claim 1, line 1) wherein the chip can perform two or more sequential tasks (claim 1, line 10, task performed through use of magnetic field; and claim 11, line 3, task of immobilizing a moiety or ligand) and wherein at least one of the sequential tasks is a processing tasks (e.g. claim 11, line 3, immobilizing a moiety or ligand.)

As to claim 20, the chip comprises an electromagnetic element (claim 1, line 4.)

As to claim 22, there is at least one electrode (claim 4.)

As to claim 24, the chip is considered to comprise a particle switch layer (claim 8.)

As to claim 25, there is at least one chamber (claim 1, lines 4-5.)

As to claim 28, a sample can remain continuously within the system from the beginning of the first of the sequential tasks until the end of the last sequential task (claim 1, line 10, task performed through use of magnetic field; and claim 11, line 3, task of immobilizing a moiety or ligand.)

As to claim 29, the chip is automated (claim 1, line 10, task performed through use of magnetic field; and claim 11, line 3, task of immobilizing a moiety or ligand.)

As to claim 36, the active chip is considered a particle switch chip (claim 8.)

Patent '367 teaches use of electromagnetic units to produce a magnetic field (claim 1, lines 9-10.) However, Patent '367 does not disclose that the chip is a multiple force chip.

Blankenstein discloses a chip for particle separation utilizing electrophoretic separation and magnetophoresis (column 1, lines 9-14.) Blankenstein teaches that

manipulation of particles may be made using "magnetic field, electric field, gravity field and any combination of such fields" (column 5, lines 58-60.) It would have been obvious that the manipulation of particles in the apparatus of Patent '367 can be performed by a combination of fields including magnetic and electric field, as an alternative to utilizing just a magnetic field, as taught by Blankenstein.

Furthermore, as to claim 30, Patent '367 does not disclose that there are two or more chips. Utilizing two chips, instead of one chip, for multiple analyses of different analytes or for providing a control for example, is a well known and conventional means used in laboratory work and involves only routine skill in the art.

As to claims 34-35, one chip is considered a passive chip (i.e., when electromagnetic field is not in use) and another chip an active chip (i.e., when the electromagnetic field is in use).

2. Claims 23 and 26 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6,716,642, in view of Blankenstein, 6,432,630, as applied to claim 1, and further in view of Fuhr et al., 6,056,861.

Patent '642 in view of Blankenstein discloses the claim substantially as claimed (see above). More specifically, Blankenstein '642 teaches that the field may be magnetic field or electric field or a combination (column 5, lines 58-59.) Blankenstein teaches that particles can be manipulated by electrophoretic separation and magnetophoresis (column 1, lines 10-13; and column 7, lines 30-34.) However,

Blankenstein does not teach that the chip comprises a traveling wave dielectrophoresis electrode array layer.

Fuhr, like Patent '642 and Blankenstein, discloses a chip (column 1, line 18), for manipulation of particles (column 1, lines 21-25.) Fuhr further teaches traveling electric fields used to move particles (column 1, lines 21-25; and column 8, lines 4-12.) This traveling electric field (column 1, lines 21-25 and column 8, lines 4-12) is the same as what Applicant describes as traveling wave dielectrophoresis.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize traveling wave dielectrophoresis as the electric field in the Patent' '642 in view of Blankenstein, since it is a known technology using an electric field and known to be useful in a chip for manipulation of particles, as taught by Fuhr.

3. Claims 19, 20, 22, 24, 25, 27-30, and 33-36 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 19 of U.S. Patent No. 6,355,491, in view of Blankenstein, 6,432,630.

Patent '491 in view of Blankenstein discloses the invention substantially as claimed

More specifically, as to claim 19, Patent '491 discloses a system comprising a chip (claim 1, line 1) wherein the chip can perform two or more sequential tasks (claim 1, line 10, task performed through use of magnetic field; and claim 14, line 12, task of immobilizing ligand molecules) and wherein at least one of the sequential tasks is a processing tasks (e.g. claim 14, line 12, immobilizing a ligand molecule.)

As to claim 20, the chip comprises an electromagnetic element (claim 1, line 4.)

As to claim 22, there is at least one electrode (claim 4.)

As to claim 24, the chip is considered to comprise a particle switch layer (claim 9.)

As to claim 25, there is at least one chamber (claim 40.)

As to claim 28, a sample can remain continuously within the system from the beginning of the first of the sequential tasks until the end of the last sequential task (claim 1, line 10, task performed through use of magnetic field; and claim 14, line 12, task of immobilizing a ligand molecule.)

As to claim 29, the chip is automated (claim 1, line 10, task performed through use of magnetic field; and claim 14, line 12, task of immobilizing a ligand molecule.)

As to claim 36, the active chip is considered a particle switch chip (claim 9.)

Patent '491 teaches use of electromagnetic units to produce a magnetic field (claim 1, lines 8-10.) However, Patent '491 does not disclose that the chip is a multiple force chip.

Blankenstein discloses a chip for particle separation utilizing electrophoretic separation and magnetophoresis (column 1, lines 9-14.) Blankenstein teaches that manipulation of particles may be made using "magnetic field, electric field, gravity field and any combination of such fields" (column 5, lines 58-60.) It would have been obvious that the manipulation of particles in the apparatus of Patent '491 can be performed by a combination of fields including magnetic and electric field, as an alternative to use of only a magnetic field, as taught by Blankenstein.

Furthermore, as to claim 30, Patent '491 does not disclose that there are two or more chips. Utilizing two chips, instead of one chip, for multiple analyses of different analytes or for providing a control for example, is a well known and conventional means used in laboratory work and involves only routine skill in the art.

As to claims 34-35, one chip is considered a passive chip (i.e., when electromagnetic field is not in use) and another chip an active chip (i.e., when the electromagnetic field is in use).

4. Claims 23 and 26 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6,355,491, in view of Blankenstein, 6,432,630, as applied to claim 1, and further in view of, Fuhr et al., 6,056,861.

Patent '491 in view of Blankenstein discloses the claim substantially as claimed (see above). More specifically, Blankenstein '642 teaches that the field may be magnetic field or electric field or a combination (column 5, lines 58-59.) However, Blankenstein does not teach that the chip comprises a traveling wave dielectrophoresis electrode array layer.

Fuhr, like Patent '491 and Blankenstein, discloses a chip (column 1, line 18), for manipulation of particles (column 1, lines 21-25.) Fuhr further teaches traveling electric fields used to move particles (column 1, lines 21-25; and column 8, lines 4-12.) This traveling electric field is the same as what Applicant describes as traveling wave dielectrophoresis (column 1, lines 21-25 and column 8, lines 4-12.)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize traveling wave dielectrophoresis as the electric field in the Patent' '491 in view of Blankenstein device, since it is a known technology using an electric field and known to be useful in a chip for manipulation of particles, as taught by Fuhr.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claim 19, 20, 22, 24, 25 and 28-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Blankenstein, 6,432,630.

As to claim 19, Blankenstein discloses a biochip comprising a chip wherein the chip is a multiple force chip (column 5, lines 58-60, wherein the biochip system can perform two or more sequential tasks, and wherein at least one of the sequential tasks is a processing task (column 8, lines 65-67.)

As to claim 20, the chip comprises an electromagnetic element (column 1, line 9-14; and column 7, lines 30-34.)

As to claim 22, the chip comprises an electrode (column 6, line 54.)

As to claim 24, the chip is considered to comprise a particle switch layer (e.g., the electrodes, column 6, line 54, capable of being switching on to generate an electric field.)

As to claim 25, the system further comprises a chamber (column 6, line 56.)

As to claim 28, a sample can remain continuously within the system from the beginning of the first of the sequential tasks until the end of the last sequential task (column 10, lines 52-54.)

As to claim 29, the chip is automated (column 10, lines 52-54.)

As to claims 30-33, more than one apparatus is disclosed (column 1, line 5.)

As to claims 34-35, one chip is considered a passive chip (when an electric field is generated, column 6, line 54) and another chip is considered an active chip (when an electric field is not generated).

As to claim 36, the active chip is considered a particle switch chip (column 6, line 54, the electrodes are capable of being switching on to generate an electric field.)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 23 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blankenstein, 6,432,630, in view of, Fuhr et al., 6,056,861.

Blankenstein discloses the claim substantially as claimed (see above). More specifically, Blankenstein '642 teaches that the field may be magnetic field or electric field or a combination (column 5, lines 58-59.) Blankenstein teaches that particles can be manipulated by electrophoretic separation and magnetophoresis (column 1, lines 10-13; and column 7, lines 30-34.) However, Blankenstein does not teach that the chip comprises a traveling wave dielectrophoresis electrode array layer.

Fuhr, like Blankenstein, discloses a chip (column 1, line 18), for manipulation of particles (column 1, lines 21-25.) Fuhr further teaches traveling electric fields used to move particles (column 1, lines 21-25; and column 8, lines 4-12.) This traveling electric field is the same as what Applicant describes as traveling wave dielectrophoresis (column 1, lines 21-25 and column 8, lines 4-12.)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize traveling wave dielectrophoresis as the electric field in the Blankenstein chip, since it is a known technology using an electric field and known to be useful in a chip for manipulation of particles, as taught by Fuhr.

Allowable Subject Matter

7. Claim 21 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claim 31 and 32 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed March 1, 2004 have been fully considered but they are not persuasive.

Applicant argues that the references above do not disclose a multiple force chip and that a multiple force chip as defined in the specification means a chip that has different physical force-generating elements (see page 6 of Applicant's response.)

In response, Examiner has pointed out in the above rejection that Blankenstein teaches an apparatus for particle separation by using magnetic field, electric field, gravity field and any combination of such fields (column 5, lines 58-60.) Thus, Blankenstein teaches a multiple force chip as defined by Applicants.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kovacs et al., 5,833,603, discloses a biochip having an acoustic element (column 14, lines 18-43; and column 16, lines 12-18.)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ann Y. Lam whose telephone number is 571-272-0822. The examiner can normally be reached on M-Sat 11-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A.L.

Christopher L. Chin

CHRISTOPHER L. CHIN
PRIMARY EXAMINER
GROUP ~~1800~~ 1641